

August 7, 2007

Ms. Shirley J. Olinger, Acting Manager
Office of River Protection
United States Department of Energy
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Mr. David A. Brockman, Manager
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Re: Field-Filtering of Ground Water Samples Prior to Laboratory Analysis

Dear Ms. Olinger and Mr. Brockman:


This letter addresses the Washington State Department of Ecology's and the U.S. Environmental Protection Agency's ongoing concern with the field-filtering of ground water samples prior to laboratory analysis. Currently, Hanford Site ground water monitoring well samples tested for metals are being field-filtered prior to laboratory analysis. The use of field-filtered ground water samples may cause an underestimation of the amount of contamination that is naturally mobile in the ground water.


The enclosure lists the requirements for collection and laboratory analysis of ground water samples. It includes applicable portions of the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8; Washington State Administrative Code requirements; EPA guidance; and supporting publications.

Ecology and the U.S. Environmental Protection Agency, therefore, notify you that future ground water samples should not be field-filtered unless the turbidity exceeds 5 nephelometric turbidity units. Field-filtering under any other circumstances must be specifically requested, with basis provided, and approved by Ecology or EPA in work plans. It should also be noted that individual project managers may require duplicate filtered and unfiltered analyses in some situations.

If you have questions, please contact Cheryl Whalen, with Ecology, at 509-372-7972 or Dennis Faulk, with EPA, at 509-376-8631.

Sincerely,


Jane A. Hedges
Program Manager
Nuclear Waste Program
Washington State Department of Ecology


Nicholas Ceto
Program Manager
Hanford Project Office
United States Environmental Protection Agency

bj/lkd
Enclosure
cc: See page 2

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cc: Dave Bartus, EPA
Tom Post, EPA
Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: Ground Water *H-0-11*
Environmental Portal

ENCLOSURE

Field-Filtering of Ground Water Samples Prior to Laboratory Analysis

Permit and Regulations

1. Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Rev. 8, II.Y.1 and II.Y.1d

Washington Administrative Code (WAC) 173-340-720(9)(b): Analyses shall be conducted on unfiltered ground water samples, unless it can be demonstrated that a filtered sample provides a more representative measure of ground water quality. The department expects that filtering will generally be acceptable for iron and manganese and other naturally occurring inorganic substances where:

- (i) A properly constructed monitoring well cannot be sufficiently developed to provide low turbidity water samples;
 - (ii) Due to natural background concentration of hazardous substances in the aquifer material, unfiltered samples would not provide a representative measure of ground water quality; and
 - (iii) Filtering is performed in the field with all practicable measures taken to avoid exposing the ground water sample to the ambient air before filtering.
2. Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Rev. 8, I.E.10.a

WAC 173-303-110(1) Sampling and testing methods: This section sets forth the testing methods to be used to comply with the requirements of this chapter (WAC 173-303).

WAC 173-303-110(3)(a) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication, SW-846: Chapter 11.4.3(c) for ground water states: Samples containing less than 5 nephelometric turbidity units (NTU) turbidity are acceptable for analysis when the analytic method is sensitive to turbidity (such as the analysis of metals). Samples containing greater than 5 NTU are only acceptable when well development is certified by a qualified hydrogeologist as the best obtainable. Conditions: Turbidity evaluation must accompany all potentially affected values.

3. Washington State Department of Ecology, Responsiveness Summary on the Amendments to the Model Toxics Control Act Cleanup Regulation Chapter 173-340 WAC, February 1991, p. 206.

Organic contaminants represent a difficult problem. Filtering of organically contaminated waters is generally not recommended since much of the organics can be lost during the filtering process due to volatilization and absorption on the filling apparatus. The suggestion to use non-standard techniques such as centrifugation and/or decanting, while it has merit, is not sufficiently developed as a standard protocol to include as an option. There is also a concern that if the soil matrix is so contaminated with sorbed organics, it is inappropriate to consider the ground water clean.

Guidance

4. EPA Resource Conservation and Recovery Act: Draft Technical Guidance (EPA 1992) pp. 7-20. [This document is distributed by USEPA to update technical information contained in other sources of USEPA guidance, such as Chapter Eleven of the SW-846 (Rev. 0, Sept 1986) and the Technical Enforcement Guidance Document (TEDG).]

The Agency generally does not recommend filtering ground-water samples in the field prior to analysis for metals. One of the primary reasons is that data generated from filtered samples provide information on only the dissolved constituents that are present, because suspended materials are removed by the filtration process. Research in ground-water sampling protocol indicates that hazardous constituents are mobile in the subsurface in both the aqueous (dissolved) phase and the solid phase.

Publications

5. EPA Superfund Ground Water Issue, *Ground Water Sampling for Metals Analyses*, Robert W. Puls and Michael J. Barcelona, EPA/540/4-89/001, March 1989.

The findings and recommendations of the committee were that use of a 0.45 μm filter was not useful, appropriate, or reproducible in providing information on metals mobility in groundwater systems, nor was it appropriate for determination of truly "dissolved" constituents in groundwater.

6. EPA Ground Water Issue, *Low-Flow (Minimal Drawdown) Ground-water Sampling Procedures*, Robert W. Puls and Michael J. Barcelona, EPA/540/S-95/504, April 1996.

Decisions to filter samples should be dictated by sampling objectives rather than as a fix for poor sampling practices, and field-filtering of certain constituents should not be the default.

7. Puls, R. W. and Powell, R. M. (1992). *Acquisition of Representative Ground Water Quality Samples for Metals*. Ground Water Monitoring Review, 12(3), p.173.

We propose the collection of ground water quality samples for metals using low flow rate purging and sampling at the required or objective sampling point within the well, monitoring of appropriate water quality indicators to signal sample collection, and no filtration. This would provide an assessment of both dissolved and mobile particulate-associated metals available for potential transport. If estimates of dissolved metal concentration are desired (e.g. for geochemical modeling purposes), then use of in-line 0.1 μm filters with large surfaces area, at the wellhead, is recommended.